SILICON
CONSULTING ENGINEERS

NO.SC/QC/YRI/2019-20/W8-SN2

Date: 26-02-2021

To,
The Executive Engineer,
RI,Yelahanka Division,
Bangalore.

"PMC CERTIFICATE AND INSPECTION REPORT"

Dear Sir,

Subject: Regarding Inspection Report for the below mentioned work.

Name of Work:Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli

Item No	Description of work	Unit	Qty	Remarks
1	Removing & Refixing stone slabs of drains and pointing in C.M (1:3)	Sqm	1239.00	Work done upto the Billed Quantity and the Quality is Satisfactory
2	KSRRB 300-1. Earthwork excavation by manual means for roads, drains & similar works in ordinary soil excavated surface levelled and sides neatly dressed, the disposed earth to be levelled neatly	Cum	243.16	Work done upto the Billed Quantity and the Quality is Satisfactory
3	Providing granite slabs of selected quality roughly dressed and fixed in cement mortar (1:6) including fixing curing etc., complete. 7.5	Cum	217.50	Work done upto the Billed Quantity and the Quality is Satisfactory
4	KSRRB M2100-10. Providing and laying Plain cement concrete of mix 1:3:6 with OPC @ 220kgs, with crushed 40mm and down size graded granite metal coarse aggregates @0.89cum and fine	Cum	35.36	Work done upto the Billed Quantity and the Quality is Satisfactory
5	Providing and laying plain/reinforced cement concrete for side drains using M20 nominal mix concrete with OPC at 300 kgs. with 20mm and down size granite metal coarse aggregates at 0.69	Cum	104.40	Work done upto the Billed Quantity and the Quality is Satisfactory
6	KSRB 4.9.2 : Providing T.M.T steel reinforcement for R.C.C work including straightening, cutting, bending, hooking, placing in position, lapping and / or welding wherever required, tying with	Tn	5.21	Work done upto the Billed Quantity and the Quality is Satisfactory
7	Providing and Fixing pre cast covering Slab 250mm thick made out of CC 1:2:4 and jelly 20mm Down size with steel reinforcement including form work,curing,including cost of alll	Sqm	318.15	Work done upto the Billed Quantity and the Quality is Satisfactory
8	Providing and Fixing pre cast covering Slab made out of CC 1:2:4 with 100mm thick and Finishing cutting ,including form work,curing,including cost of alll materials, labour,hire charges of	Sqm	60.00	Work done upto the Billed Quantity and the Quality is Satisfactory
9	KSRRB M300-14. Excavation for roadwork in all types of soil by mechanical means including cutting and loading to tippers, trimming bottom and side slopes, in accordance with	Cum	183.21	Work done upto the Billed Quantity and the Quality is Satisfactory
10	KSRRB 300-50. Scarifying bituminous course 50mm to 75mm thick along with premix carpet / surface dressing by mechanical means attached with scarifier without disturbing the base and	Sqm	717.47	Work done upto the Billed Quantity and the Quality is Satisfactory

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E-mail siliconcivilengineers@gmail.com

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11	Construction of granular sub-base Grading-V as Sub-base and drainage layer by providing coarse graded crushed stone aggregates of granite/ trap/basalt material, mixing in a	Cum	171.62	Work done upto the Billed Quantity and the Quality is Satisfactory
12	KSRRB M400-17. Providing, laying, spreading and compacting cushed stone aggregates of granite / trap / basalt to wet mix macadam specifications including pre mixing the material with	Cum	455.20	Work done upto the Billed Quantity and the Quality is Satisfactory
13	KSRRB M500-6. Providing and applying primer coat with S.S. bitumen emulsion on prepared surface of granular base such as WMM including cleaning of road surface and spraying primer at	Sqm	2387.60	Work done upto the Billed Quantity and the Quality is Satisfactory
14	KSRRB 500-2. Cleaning the existing black topped surface with brooms, soft brushes and finally dusting with old gunny bags and / or compressed air to receive bituminous treatment including	Sqm	6062.00	Work done upto the Billed Quantity and the Quality is Satisfactory
15	KSRRB 500-7. Providing and applying tack coat using 80/100 grade bitumen(VG10) on the prepared black topped surfaces at 2.5 kg per 10 sqm, heating bitumen in boiler fitted with spray set	Sqm	8864.60	Work done upto the Billed Quantity and the Quality is Satisfactory
16	KSRRB M500-17. Providing and laying dense graded bituminous macadam using crushed aggregates of specified grading, premixed with VG30 grade bituminous binder and, transporting	Cum	154.23	Work done upto the Billed Quantity and the Quality is Satisfactory
17	Providing and laying bituminous concrete 40mm thick with hot mix plant, using crushed aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot	Cum	343.11	Work done upto the Billed Quantity and the Quality is Satisfactory
18	KSRRB M800-13.Road Marking with Hot Applied Thermoplastic Compound with Reflectrising Glass Beads on Bituminous Surface/ Concrete Surface: Providing and laying of hot applied	Sqm	280.27	Work done upto the Billed Quantity and the Quality is Satisfactory
19	KSRRB M800-35. Supply and Installtion of Moulded Shank Raised Pavement Markers made of polycarbonate and ABS(Acrylonitrile Butadiene Styrene) moulded body and reflective panels with	Nos	329.00	Work done upto the Billed Quantity and the Quality is Satisfactory

With respect to the above subject & name of the work, we have inspected the work and the Quantity and Quality of above mentioned items of the work was found to be completed satisfactorily for the 1st and Final bill

Thanking you,

With Regards,

For Silicon Consulting Engineers

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#S1317, 4th CROSS BEL 2nd STAGE BHARATH NAGAR ,BANGALORE – 560 091. CELL : 9448353883
E-mail siliconcivilengineers@gmail.com

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CONSULTING ENGINEERS

NO.SC/QC/YH/2019-20/WB-SN2 Date: 26-02-2021

To,
The Executive Engineer,
RI,Yelahanka Division,
Bangalore.

"FREQUENCY AND QUALITY REPORT"

Dear Sir,

Subject: Regarding Quality Report for the below mentioned work.

Name of Work:Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli

Item No	Description of work	Unit	Qty	No of Samples	Standards
1	KSRRB M2100-10. Providing and laying Plain cement concrete of mix 1:3:6 with OPC @ 220kgs, with crushed 40mm and down size graded granite metal coarse aggregates @0.89cum and fine	Cum	35.36	1	Per 100 Cum
2	Providing and laying plain/reinforced cement concrete for side drains using M20 nominal mix concrete with OPC at 300 kgs. with 20mm and down size granite metal coarse aggregates at 0.69	Cum	104.40	6	Per 50 Cum
3	KSRB 4.9.2 : Providing T.M.T steel reinforcement for R.C.C work including straightening, cutting, bending, hooking, placing in position, lapping and / or welding wherever required, tying with binding	Ton	5.21	1	Per Each Dia
4	Construction of granular sub-base Grading-V as Sub-base and drainage layer by providing coarse graded crushed stone aggregates of granite/ trap/basalt material, mixing in a mechanical mix plant at OMC,	Cum	171.62	1	Per 200 Cum
5	KSRRB M400-17. Providing, laying, spreading and compacting cushed stone aggregates of granite / trap / basalt to wet mix macadam specifications including pre mixing the material with water at	Cum	455.20	3	Per 200 Cum
6	KSRRB M500-17. Providing and laying dense graded bituminous macadam using crushed aggregates of specified grading, premixed with VG30 grade bituminous binder and, transporting the hot mix to	Cum	154.23	3	Per 50 Cum

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E-mail siliconcivilengineers@gmail.com

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7	Providing and laying bituminous concrete 40mm thick with hot mix plant, using crushed aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work	Cum	343.11	7	Per 50 Cum

With respect to the above subject & name of the work, we have tested the materials and the Quantity of above mentioned items of the work was found to be completed satisfactorily for the 1st and Final bill

Thanking you,

With Regards,

For Silicon Consulting Engineers

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SC/QC/YRI/20-21/W8-TN2-C1 **Date: 04-12-2020**

1. TEST REPORT ON CEMENT:

Sub: Testing of 53 Grade Cement Sample (IS 12269-1987).
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

PHYSICAL TESTS ON CEMENT

Grade * : 53,
Type * : O.P.C

TABLE 1.1:

SL No	Name of Test	Test Results	Requirements as per IS 8112-1989
1	Initial setting time	**162 min**	Shall not be less than 30 min
2	Final setting time	**270 min**	Shall not be more than 600 min
3	Fineness (by dry sieving on IS 90 micron sieve)	**2.15%**	Not to exceed 10.0%
4	Soundness test(by Le-Chatelier's method)	**2.08mm**	Shall not be more than 10 mm
5	Compressive strength a) 3 days (average of three results)	**28.74 N/Sq mm**	Shall not be less than 27 N/Sqmm

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Rd

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Assistant Executive Engineer
Road Infrastructure, (Yelahanka Division)
Brihat Bengaluru Mahanagara Palike
Bengaluru - 92.

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SC/QC/YRI/20-21/W8-TN2-PCC1 **Date: 04-12-2020**

1. TESTING OF COARSE AND FINE AGGREGATES:

Sub: Testing of Coarse and Fine aggregates to be used for bed concrete.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

1. COARSE AGGRGATES TABLE - SIEVE ANALYSIS:

IS Sieve Size, mm	Percentage passing	Requirements as per IS 383-1970 (Reaffirmed on 2007) % Passing	
	40 mm Sample	Single size	Graded
40mm	**100.00**	85-100	90 – 100
20mm	**66.45**	0 -20	30- 70
10mm	**30.80**	0 -5	10- 35
4.75mm	**4.05**	-----	0- 5

2. FINE AGGREGATES TABLE - SIEVE ANALYSIS:

IS Sieve Size, mm	Percentage Passing	Specification as Per IS: 383-1970(Reaffirmed 2002) Percentage Passing			Remarks
		Zone-I	Zone-II	Zone -III	
04.75	**95.70**	90-100	90-100	90-100	The Sample Conforms to Grading **Zone-II**
02.36	**82.25**	60-95	75-100	85-100	
01.18	**74.05**	30-70	55-90	75-100	
600.mic	**47.80**	15-34	35-59	60-79	
300.mic	**24.15**	5-20	8-30	12-40	
150.mic	**6.80**	0-10	0-10	0-10	

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : : Balaji Layout 1st Cross Rd

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Assistant Executive Engineer
Road Infrastructure, (Yelahanka Division)
Brihat Bangalore Mahanagara Palike
Bangalore - 02

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SC/QC/YR1/20-21/W8-TN2-CE1 **Date: 07-12-2020**

1. TEST REPORT ON CEMENT:

Sub: Testing of 53 Grade Cement Sample (IS 12269-1987).
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

PHYSICAL TESTS ON CEMENT

Grade * : 53,
Type * : O.P.C

TABLE 1.1:

SL No	Name of Test	Test Results	Requirements as per IS 8112-1989
1	Initial setting time	**158 min**	Shall not be less than 30 min
2	Final setting time	**270 min**	Shall not be more than 600 min
3	Fineness (by dry sieving on IS 90 micron sieve)	**1.86 %**	Not to exceed 10.0%
4	Soundness test(by Le-Chatelier's method)	**1.94 mm**	Shall not be more than 10 mm
5	Compressive strength a) 3 days (average of three results)	**28.53 N/Sq mm**	Shall not be less than 27 N/Sqmm

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Rd Ch:94.90 to 120.30m

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Assistant Executive Engineer
Road Infrastructure, (Yelahanka Division)
Bruhat Bangalore Mahanagara Palike

#S1317, 4th CROSS BEL 2nd STAGE BHARATH NAGAR ,BANGALORE – 560 091. CELL : 9448353883
E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-FA1 **Date: 07-12-2020**

1. TESTING OF FINE AGGREGATES :

Sub: Testing of Fine Aggregates.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TABLE - 1.1 : SIEVE ANALYSIS :

IS Sieve Size,mm	Percentage Passing	Specification as Per IS: 383-1970(Reaffirmed 2002) Percentage Passing			Remarks
		Zone-I	Zone-II	Zone -II	
04.75	**96.15**	90-100	90-100	90-100	The Sample Conforms to Grading **Zone-II**
02.36	**82.25**	60-95	75-100	85-100	
01.18	**74.05**	30-70	55-90	75-100	
600. mic	**46.65**	15.34	35-59	60-79	
300.mic	**22.45**	5-20	8-30	12-40	
150.mic	**6.30**	0-10	0-10	0-10	

TABLE 1.2 :

Sl No	Test Conducted	Sample	Results	**Requirements** as Per IS. Specification IS :383-1970 (Reaffirmed 2002)
1	Bulking of Sand	001	**17.64 %**	-----
2	Silt Content	----	**0.59%**	Not more than 8%
3	Specific Gravity	----	**2.61**	-------

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Rd Ch:94.90 to 120.30m

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Road Improvement ... Yelahanka Division)
... Sahakaranagara Palike
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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-CA1 Date: 07-12-2020

1. TESTING OF COARSE AGGREGATES (20 mm):

Sub: Testing of Construction Materials.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no 08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI, Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

Table - 1.1 : SIEVE ANALYSIS :

IS Sieve Size, mm	Percentage passing	Requirements as per IS 383-1970 (Reaffirmed on 2002) % Passing	
	20 mm Sample	Single size	Graded
40 mm	100.00	100.00	100.00
20 mm	95.25	85-100	90 - 100
10 mm	47.60	0 - 20	25 - 55
4.75 mm	3.90	0 - 5	0 - 10

TABLE 1.2 :

SL No	Test conducted	Results	Requirements as per IS:383-1970 & Tests Conforms to IS 2386(Part I to IV) – 1963 (Reaffirmed on 2002)
1.	Flakiness Index	26.42%	Not to exceed 25 %
2.	Crushing value	28.76%	Not to exceed 45 % for concrete other than for wearing surfaces and 30% for concrete for wearing surfaces

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : : Balaji Layout 1st Cross Rd Ch:93.10 to 123.10m

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
BBMP Bangalore Mahanagara Palike
Bangalore - 92.

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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-S1 **Date: 07-12-2020**

1. TEST REPORT ON REINFORCEMENT STEEL:

Sub: Testing of Reinforcement Steel of diameter 10 mm **TMT Steel.**
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TABLE – 1

SL No	Details	For 10 mm	
		Test Results	Min Req. as per IS 1786-2008
01	Observed diameter of bar	**10.0 mm**	10.0 mm
02	Observed Wt/m Length **Kg/m**	**0.621**	0.567
03	Proof stress/Yield stress, fy , **N/mm^2**	**554.0**	500.0
04	Bend/ Re bend Test	**Ok**	---
05	Percentage of Elongation, %	**20.70**	16.00
06	Ultimate Tensile Strength **N/mm^2**	**639.0**	565.0

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Rd

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 92.

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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-CB1 **Date: 21-12-2020**

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 07days Compressive Strength).
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm
Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	15-12-20	22-12-20	07	22500	370	16.44	**16.67**
	002	‘’	“	‘’	“	380	16.89	
	003	‘’	“	‘’	“	375	16.67	

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Rd Ch:60.00 to 75.60m

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SC/QC/YRI/20-21/W8-TN2-CB2 Date: 24-12-2020

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 07days Compressive Strength).
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm
Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	17-12-20	24-12-20	07	22500	380	16.89	**16.81**
	002	''	"	''	"	370	16.44	
	003	''	"	''	"	385	17.11	

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Rd Ch:146.60 to 176.60m

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 02.

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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-CB3 **Date: 28-12-2020**

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 07days Compressive Strength).
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm

Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	21-12-20	28-12-20	07	22500	360	16.00	**16.07**
	002	‘’	“	‘’	“	355	15.78	
	003	‘’	“	‘’	“	370	16.44	

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Rd Ch:123.10 to 153.10m

Assistant Executive Engineer
Road Infrastructure, Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
...-02.

SILICON CONSULTING ENGINEERS

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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-CB1A

Date: 12-01-2021

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 28days Compressive Strength).
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm

Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	15-12-20	12-01-21	28	22500	505	22.44	**22.59**
	002	"	"	"	"	520	23.11	
	003	"	"	"	"	500	22.22	

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : : Balaji Layout 1st Cross Rd Ch:60.00 to 75.60m

Assistant Executive Engineer
Road Infrastructure
Bruhat Bangalore
Yelahanka Division)
Mahanagara Palike

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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-CB2A

Date: 15-01-2021

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 28days Compressive Strength).
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm
Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	17-12-20	15-01-21	29	22500	515	22.89	**22.81**
	002	"	"	"	"	500	22.22	
	003	"	"	"	"	525	23.33	

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Rd Ch:146.60 to 176.60m

Assistant Executive Engineer
Road Infrastructure, Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 02.

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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-CB3A

Date: 18-01-2021

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 28days Compressive Strength).
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm
Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	21-12-20	18-01-21	28	22500	510	22.67	**23.04**
	002	''	"	''	"	525	23.33	
	003	''	"	''	"	520	23.11	

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Rd Ch:123.10 to 153.10m

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 92.

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SC/QC/YRI/20-21/W8-TN2-G1

Date: 22-01-2021

TEST REPORT ON GRANULAR SUBBASE MIX
(GRADATION TEST)

Sub: To conduct tests on GSB (Grade-V) mix.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

1. **Gradation Test:**
TABLE 1.1

Sieve Size mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Specified Limits as per MoRTH Specifications, V Revision-2013
75.00	**100.00**	100
53.00	**94.35**	80-100
26.50	**76.90**	55-90
9.50	**54.25**	35-65
4.75	**46.10**	25-50
2.36	**18.35**	10-20
0.85	**7.15**	2-10
0.425	**4.05**	0-5

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : 21st Cross Rd

AE

Assistant Executive Engineer
Road ... Yelahanka Division)
Bruhat Ban... Palike
Bangalore - 92.

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Date: 22-01-2020

TABLE 1.2

SL No	Test conducted	Test Results	Tests Conforms to IS 2386(Part I to IV)– 1963 (Reaffirmed on 2002) & Requirements as per IS:383-1970 & M.o.R.T.H Specification, V Revision -2013.
1.	Water absorption, %	**0.42 %**	Not more than 2.0 %
2.	Liquid Limit, %	**18.34**	Not more than 25.0 %
3.	Plasticity Index, %	**NP**	Not more than 6.0 %
4.	Moisture Content, %	**6.56**	----------
5.	Aggregate Impact Value, %	**28.74**	Not more than 40.00 %

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : 21st Cross Rd

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Assistant Executive Engineer
Road Infrastructure Development Division
Brihat Bengaluru Mahanagara Palike
Bengaluru - 02.

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Date: 25-01-2021

TABLE 1.2

SL No	Test conducted	Test Results	Tests Conforms to IS 2386(Part I to IV)– 1963 (Reaffirmed on 2002) & Requirements as per IS:383-1970 & M.o.R.T.H Specification, V Revision -2013.
1.	Aggregate Impact Value	**27.92 %**	Not more than 30.00 %
2.	Combined Flakiness and Elongation index, %	**28.54 %**	Not more than 35.0 %
3.	Water absorption, %	**0.42 %**	Not more than 2.0 %
4.	Plasticity Index, %	**NP**	Not more than 6.0 %

The result of the materials tested meets the standards and hence can be used for the work.

Sample Collected Site : Balaji Layout 1st Cross Rd

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SC/QC/YRI/20-21/W8-TN2-W2 **Date: 28-01-2021**

TEST REPORT ON WET MIX MACADAM MIX
(GRADATION TEST)

Sub: To conduct Gradation test on Wet Mix Macadam (WMM) Mix.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

1. Gradation Test:

TABLE 1.1

Sieve Size mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Specified Limits as per MoRTH Specifications, V Revision-2013
53.00	**100.00**	100
45.00	**97.10**	95-100
26.50	**---**	-
22.40	**70.35**	60-80
11.20	**52.80**	40-60
4.75	**34.45**	25-40
2.36	**23.15**	15-30
0.600	**18.70**	8-22
0.075	**3.50**	0-5

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : NTI Layout Shanthi Nivas Road Continued

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 92

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SC/QC/YRI/20-21/W8-TN2-W3 **Date: 29-01-2021**

TEST REPORT ON WET MIX MACADAM MIX
(GRADATION TEST)

Sub: To conduct Gradation test on Wet Mix Macadam (WMM) Mix.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

1. Gradation Test:

TABLE 1.1

Sieve Size mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Specified Limits as per MoRTH Specifications, V Revision-2013
53.00	**100.00**	100
45.00	**96.35**	95-100
26.50	**---**	-
22.40	**73.25**	60-80
11.20	**51.45**	40-60
4.75	**34.90**	25-40
2.36	**22.50**	15-30
0.600	**19.05**	8-22
0.075	**3.80**	0-5

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Ward Office Rd

Assistant Executive Engineer
Road Infrastructure, (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 92.

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SC/QC/YRI/20-21/W8-TN2-W3 Date: 29-01-2021

TEST REPORT ON WET MIX MACADAM MIX
(GRADATION TEST)

Sub: To conduct Gradation test on Wet Mix Macadam (WMM) Mix.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

1. Gradation Test:
TABLE 1.1

Sieve Size mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Specified Limits as per MoRTH Specifications, V Revision-2013
53.00	**100.00**	100
45.00	**96.35**	95-100
26.50	---	-
22.40	**73.25**	60-80
11.20	**51.45**	40-60
4.75	**34.90**	25-40
2.36	**22.50**	15-30
0.600	**19.05**	8-22
0.075	**3.80**	0-5

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Ward Office Rd

Assistant Executive Engineer
Road Infrastructure, (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 92.

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Date: 29-01-2021

TABLE 1.2

Sl. No	Test conducted	Test Results	Tests Conforms to IS 2386(Part I to IV)– 1963 (Reaffirmed on 2002) & Requirements as per IS 383-1970 & M o R T H Specification, V Revision -2013.
1.	Aggregate Impact Value	**27.84%**	Not more than 30.00 %
2.	Combined Flakiness and Elongation index, %	**28.56%**	Not more than 35.0 %
3.	Water absorption, %	**0.41 %**	Not more than 2.0 %
4.	Plasticity Index, %	**NP**	Not more than 6.0 %

The result of the materials tested meets the standards and hence can be used for the work.

Sample Collected Site : Ward Office Rd

Assistant Executive Engineer
Road Infrastruct... (Shanta Division)
Bruhat ... Jagjyoti Palike

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SC/QC/YRI/20-21/W8-TN2-BD1 **Date: 02-02-2021**

1. TEST REPORT ON BITUMEN SAMPLE:

Sub: Testing of Bitumen sample VG-30 Grade.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.
Technical Reference: Ministry of Road Transport and Highways, V Revision, 2013 and IS 73: 1992.

TABLE 1.1 ;

SL No	Details	Test Results	Requirements as per I.S 73 –1992 Specifications
1.	Penetration at 25^0 C	**51.90^0 C**	Min. 45
2.	Ductility Value at 25^0 C	**109.30 cm**	40
3.	Flash point	**241^0 C**	Minimum 220^0 C
4.	Softening point	**51.70^0 C**	Min. 47

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike

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SC/QC/YRI/20-21/W8-TN2-CD1

Date: 02-02-2021

1. TEST REPORT ON COARSE AGGREGATE:

Sub: Testing of Coarse Aggregate used in Dense Graded Bituminous Macadam.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TABLE 1.1 ;

SL No	Test conducted	Test Results	Tests Conforms to IS 2386(Part I to IV)– 1963 (Reaffirmed on 2002) & Requirements as per IS:383-1970 & M.o.R.T.H Specification, V Revision -2013.
1.	Aggregate Impact Value	**23.52%**	Not more than 27.00 % for DBM
2.	Combined Flakiness and Elongation index, %	**26.29%**	Not more than 35.0 %
3.	Water absorption, %	**0.41%**	Not more than 2.0 %
4.	Specific gravity	**2.61**	-------
5.	Soundness	**6.41 %**	Max. 12 % in Sodium Sulphate

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru-92.

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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-DBM1 Date: 05-02-2021

LTEST REPORT ON BITUMINOUS MIXES :
(BITUMEN EXTRACTION TEST & GRADATION TEST)

Sub: To determine the percentage of bitumen and gradation for DBM mix sample.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

A. Type of Construction : **Dense Graded Bituminous Macadam.**
1. The bitumen content obtained after subjecting the sample for Bitumen Extraction test = **4.52 %**

2. **Gradation Test**
TABLE 1.1

Sieve Size, mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Gradation requirement as per Table 500-10 of MORTH Specfications-2013 DBM (Grading - 2)
37.5	**100**	100
26.5	**97.65**	90-100
19.0	**84.25**	71-95
13.20	**71.50**	56-80
4.75	**48.35**	38-54
2.36	**35.55**	28-42
0.300	**17.20**	7-21
0.075	**6.80**	2-8

. The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Road Ch: 98.70m to 128.70m

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bangaluru - 02.

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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/WB-TN2-D51 Date: 05.07.2021

LTEST REPORT ON BITUMINOUS MIXES :
(STABILITY OF BITUMINOUS MIX)

Sub To determine the stability of bituminous mix for DBM mix sample
(Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no 08 Kodigehalli.)

Ref. Material testing/PMC/20-21,

Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.

Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

Table 1: Properties of DBM (Gr-2) Mix

Sl. No.	Test Property	*Test results obtained by Marshall method	Requirements of Dense Bituminous Macadam, Grade-2 as per M.o.R.T&H (IV Revision)-2001 Specifications
1	Marshall Stability (75 blows) (At 60°C), kgs.	1254	900
2	Marshall Flow at 60°C, mm.	3.42	2.0 - 4.0

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Road Ch: 98.70m to 128.70m

Assistant Executive Engineer
Road Infrastructure Division (Central)
BBMP, Bangalore Mahanagara Palike

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SC/QC/YRI/20-21/W8-TN2-DS2 Date: 08-02-2021

LTEST REPORT ON BITUMINOUS MIXES :
(STABILITY OF BITUMINOUS MIX)

Sub: To determine the stability of bituminous mix for DBM mix sample.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

Table 1: Properties of DBM (Gr-2) Mix

Sl. No.	Test Property	*Test results obtained by Marshall method	Requirements of Dense Bituminous Macadam, Grade-2 as per M.o.R.T&H (IV Revision)-2001 Specifications
1	Marshall Stability (75 blows) (At 60°C), kgs.	**1250**	900
2	Marshall Flow at 60°C, mm.	**3.46**	2.0 - 4.0

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : NTI Layout Shanthi Nivas Road Continued Ch: 0.00 to 30.00m

Assistant Executive Engineer
Road Infrastructure, (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 02.

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SC/QC/YRI/20-21/W8-TN2-DBM3 Date: 10-02-2021

LTEST REPORT ON BITUMINOUS MIXES :
(BITUMEN EXTRACTION TEST & GRADATION TEST)

Sub: To determine the percentage of bitumen and gradation for DBM mix sample.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}

Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

A. Type of Construction : **Dense Graded Bituminous Macadam.**
1. The bitumen content obtained after subjecting the sample for Bitumen Extraction test = **4.52 %**

2. **Gradation Test**
TABLE 1.1

Sieve Size, mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Gradation requirement as per Table 500-10 of MORTH Specfications-2013 DBM (Grading - 2)
37.5	100	100
26.5	96.05	90-100
19.0	82.60	71-95
13.20	74.25	56-80
4.75	44.05	38-54
2.36	38.30	28-42
0.300	16.95	7-21
0.075	6.20	2-8

. The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : 9th Main Rd(Tata Nagara)

AE

Assistant Executive Engineer
Road Infrastructure, (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 02.

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SC/QC/YRI/20-21/W8-TN2-DS3

Date: 10-02-2021

1.TEST REPORT ON BITUMINOUS MIXES :
(STABILITY OF BITUMINOUS MIX)

Sub: To determine the stability of bituminous mix for DBM mix sample.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}

Ref.: Material testing/PMC/20-21,

Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.

Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

Table 1: Properties of DBM (Gr-2) Mix

Sl. No.	Test Property	*Test results obtained by Marshall method	Requirements of Dense Bituminous Macadam, Grade-2 as per M.o.R.T&H (IV Revision)-2001 Specifications
1	Marshall Stability (75 blows) (At 60°C), kgs.	**1236**	900
2	Marshall Flow at 60°C, mm.	**3.47**	2.0 - 4.0

The result of the materials tested meets the standards and hence can be used for the work.

Sample Collected Site : 9th Main Rd(Tata Nagara)

AE

Assistant Executive Engineer
Road Infrastructure, (Yelahanka Division
Bruhat Bangalore Mahanagara Palike
Bengaluru - 02.

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CONSULTING ENGINEERS

SC/QC/YRI/20-21/W8-TN2-CB1 Date: 05-02-2021

1. TEST REPORT ON COARSE AGGREGATE:

Sub: Testing of Coarse Aggregate used in Bituminous Concrete.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TABLE 1.1 ;

SL No	Test conducted	Test Results	Tests Conforms to IS 2386(Part I to IV)– 1963 (Reaffirmed on 2002) & Requirements as per IS:383-1970 & M.o.R.T.H Specification, V Revision -2013.
1.	Aggregate Impact Value	21.98 %	Not more than 24.00 %
2.	Combined Flakiness and Elongation index., %	26.12 %	Not more than 35.0 %
3.	Water absorption, %	0.42%	Not more than 2.0 %
4.	Specific gravity	2.62	------
5.	Soundness	5.66%	Max. 12 % in Sodium Sulphate

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : NTI Layout Shanthi Nivas Road Continued

AE

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bangalore-92.

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SC/QC/YRI/20-21/W8-TN2-BS1 Date: 09-02-2021

1.TEST REPORT ON BITUMINOUS MIXES :
(STABILITY OF BITUMINOUS MIX)

Sub: To determine the stability of bituminous mix for BC mix sample.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

Table 1: Properties of BC (Gr-2) Mix

Sl. No.	Test Property	*Test results obtained by Marshall method	Requirements of Bituminous Concrete, Grade-2 as per M.o.R.T&H (V Revision)-2013 Specifications
1	Marshall Stability (75 blows) (At 60°C), kgs.	**1364**	900
2	Marshall Flow at 60°C, mm.	**3.54**	2.0 - 4.0

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Balaji Layout 1st Cross Road Ch: 158.70m to 188.70m

AE

Assistant Executive Engineer
Road Infrastructure (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 92.

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E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-BC4 Date: 15-02-2021

1.TEST REPORT ON BITUMINOUS MIXES :
(BITUMEN EXTRACTION TEST & GRADATION TEST)

Sub: To determine the percentage of bitumen and gradation for BC mix sample.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

A. Type of Construction : **Bituminous Concrete**
1. The bitumen content obtained after subjecting the sample for Bitumen Extraction test = **5.43 %**

2. **Gradation Test**
TABLE 1.1

Sieve Size, mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Gradation requirement as per Table 500-17 of MORTH Specfications-2013 BC (Grading - 2)
19.0	**100**	100
13.2	**98.05**	90-100
9.5	**80.45**	70-88
4.75	**61.95**	53-71
2.36	**56.25**	42-58
1.18	**40.70**	34-48
0.600	**28.30**	26-38
0.300	**21.85**	18-28
0.150	**17.60**	12-20
0.075	**7.10**	4-10

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : Ward Office Rd Ch: 43.00m to 73.00m

AE

Assistant Executive Engineer

SILICON CONSULTING ENGINEERS

#S1317, 4th CROSS BEL 2nd STAGE BHARATH NAGAR ,BANGALORE – 560 091. CELL : 9448353883
E-mail siliconcivilengineers@gmail.com

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SC/QC/YRI/20-21/W8-TN2-BS7

Date: 18-02-2021

1.TEST REPORT ON BITUMINOUS MIXES :
(STABILITY OF BITUMINOUS MIX)

Sub: To determine the stability of bituminous mix for BC mix sample.
{Project*: Improvements to roads and drains of Sahakaranagara Main Road and surrounding areas in ward no.08 Kodigehalli.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
RI,Yelahanka Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: M/s KRIDL, Bangalore.

TEST RESULTS

Table 1: Properties of BC (Gr-2) Mix

Sl. No.	Test Property	*Test results obtained by Marshall method	Requirements of Bituminous Concrete, Grade-2 as per M.o.R.T&H (V Revision)-2013 Specifications
1	Marshall Stability (75 blows) (At 60°C), kgs.	**1352**	900
2	Marshall Flow at 60°C, mm.	**3.40**	2.0 - 4.0

The result of the materials tested meets the standards and hence can be used for the work.
Sample Collected Site : 8th Main Rd Ch: 270.00m to 300.00m

AE

SILICON CONSULTING ENGINEERS

Assistant Executive Engineer
Road Infrastructure, (Yelahanka Division)
Bruhat Bengaluru Mahanagara Palike
Bengaluru - 92.

#S1317, 4th CROSS BEL 2nd STAGE BHARATH NAGAR ,BANGALORE – 560 091. CELL : 9448353883
E-mail siliconcivilengineers@gmail.com

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